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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/719,025	11/24/2003	Fred J. Berkowitz	08935-290001 / M-5022	9154
26161	7590	03/28/2006	EXAMINER	
FISH & RICHARDSON PC P.O. BOX 1022 MINNEAPOLIS, MN 55440-1022			CHUO, TONY SHENG HSIANG	
			ART UNIT	PAPER NUMBER
			1746	

DATE MAILED: 03/28/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.		Applicant(s)	
	10/719,025		BERKOWITZ ET AL.	
	Examiner		Art Unit	
	Tony Chuo		1746	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-70 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-70 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____. |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>6/23/04, 4/22/05</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-3, 15-19, 28, 32, 37, 40-45, 49, 62, and 66-70 are rejected under 35 U.S.C. 102(b) as being anticipated by Sonoda et al (US 2002/0028389). The Sonoda reference teaches a primary lithium battery and a method of making a primary lithium battery comprising an anode including a lithium containing anode active material; a solid cathode including a current collector that includes an aluminum or aluminum alloy in the form of a net which is an expanded metal grid and a cathode active material including a manganese dioxide in contact with the current collector; a separator between the anode and the cathode; a non-aqueous electrolyte including an organic solvent and a perchlorate salt, LiClO₄, in contact with the anode, cathode and separator (See paragraphs [0027], [0035], [0040], [0043], [0051], [0054]).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 26 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sonoda et al (US 2002/0028389) in view of Sakamoto et al (US 6447957). The Sonoda reference teaches a primary battery comprising an anode including a lithium containing anode active material; a solid cathode including a current collector including aluminum and a cathode active material in contact with the current collector; and a separator between the anode and cathode. However, it does not expressly teach a current collector with a resistivity of less than 100 mΩ/cm or less than 10 mΩ/cm. The Sakamoto reference does teach a current collector selected from a 3000 series aluminum alloy which has a resistivity of 0.00382 mΩ/cm (See column 5, lines 54-62 and MatWeb Aluminum 3105-O Specifications). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Sonoda battery to include a current collector which has a resistivity of 0.00382 mΩ/cm in order to improve the performance of the battery by lowering the overall impedance of the cell.

5. Claims 4, 5, 29, 30, 39, 46, 47, 56, 57, 63, and 64 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sonoda et al (US 2002/0028389) in view of Sakamoto et al (US 6447957). The Sonoda reference is applied to claims 1-3, 15-19, 28, 32, 37, 40-45, 49, 62, and 66-70 for reasons stated above. However, it does not expressly teach a current collector including a 2000 series, a 6000 series, a 7000 series or a 6061 aluminum alloy. The Sakamoto reference teaches a current collector selected from a 3000 series aluminum alloy which has similar mechanical and electrical properties as compared to the 6061 aluminum alloy (See column 5, lines 54-62 and

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MatWeb Aluminum 3105-O Specifications). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Sonoda battery to include a current collector that has a 3105 aluminum alloy because it has high strength properties necessary for primary lithium batteries. In addition, a product which differs from prior art only in purity is obvious when the pure product does not possess any unexpected properties not possessed by the impure one (Ex parte Gray 10 USPQ 2d 1922, 1925 (BPAI 1989)).

6. Claim 38 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sonoda et al (US 2002/0028389) in view of Sakamoto et al (US 6447957). The Sonoda reference is applied to claims 1-3, 15-19, 28, 32, 37, 40-45, 49, 62, and 66-70 for reasons stated above. However, it does not expressly teach a current collector including a 1000 series, 2000 series, a 6000 series, or a 7000 series. The Sakamoto reference does teach a current collector selected from a 1000 series aluminum alloy (See column 5, lines 54-62). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Sonoda battery to include a current collector which includes a 1000 series aluminum alloy because a 1000 series aluminum alloy is suitable for primary lithium batteries due to its high strength properties.

7. Claims 6-14, 31, 48, and 65 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sonoda et al (US 2002/0028389) in view of Sakamoto et al (US 6447957). The Sonoda reference is applied to claims 1-3, 15-19, 28, 32, 37, 40-45, 49, 62, and 66-70 for reasons stated above. However, it does not expressly teach a current

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collector that includes an aluminum alloy including 0-0.4% chromium, 0.01-6.8% copper, 0.05-1.3% iron, 0.1-7% magnesium, 0-2% manganese, 0-2% silicon, less than 0.25% titanium, 0-2.3% nickel, and 0-8.2% zinc. The Sakamoto reference does teach a current collector selected from a 3000 series aluminum alloy which has 0.2% chromium, 0.3% copper, 0.7% iron, 0.2-0.8% magnesium, 0.3-0.8% manganese, 0.6% silicon, 0.1% titanium, 0% nickel, and 0.4% zinc (See column 5, lines 54-62 and MatWeb Aluminum 3105-O Specifications). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Sonoda battery to include a current collector which includes a 3000 series aluminum alloy because the composition of the 3000 series aluminum alloy results in mechanical and electrical properties suitable for primary lithium batteries.

8. Claims 20-25, 33-36, and 50-55 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sonoda et al (US 2002/0028389) in view of Sakamoto et al (US 6447957). The Sonoda reference is applied to claims 1-3, 15-19, 28, 32, 37, 40-45, 49, 62, and 66-70 for reasons stated above. However, it does not expressly teach a current collector that has a yield strength of at least 2.0 lb/in, a yield strength at least 5 lb/in, a tensile strength of at least 5 lb/in, and a tensile strength of at least 7 lb/in. The Sakamoto reference does teach a current collector selected from a 3000 series aluminum alloy which has a tensile strength of 17000 psi and a yield strength of 8000 psi (See column 5, lines 54-62 and MatWeb Aluminum 3105-O Specifications). Burden is on applicants to show differences in product comparisons. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to

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modify the Sonoda battery to include a current collector which includes a 3000 series aluminum alloy because the 3000 series aluminum alloy has higher mechanical properties suitable for primary lithium batteries.

9. Claims 58 and 59 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sonoda et al (US 2002/0028389) in view of Sakamoto et al (US 6447957) as applied to claims 4, 5, 29, 30, 39, 46, 47, 56, 57, 63, and 64 and in further view of Peled et al (US 4755440). However, it does not expressly teach a cathode active material that is a liquid or a cathode active material that includes SO_2 or SOCl_2 . The Peled reference does teach a lithium primary battery that has a liquid cathode and thionyl chloride and SO_2 (See column 1, lines 16-26). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Sonoda battery to include thionyl chloride as the cathode active material in order to produce a higher energy density battery.

10. Claims 60 and 61 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sonoda et al (US 2002/0028389) in view of Sakamoto et al (US 6447957) as applied to claims 4, 5, 29, 30, 39, 46, 47, 56, 57, 63, and 64. However, it does not expressly teach a current collector that includes a pulled grid or leveled grid. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Sonoda battery to include a current collector that includes a pulled or leveled grid because changes in shape were held to be obvious (In re Dailey 149 USPQ 47, 50 (CCPA 1966)).

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The Yoshimura et al (US 6780543) reference teaches an aluminum or aluminum alloy cathode current collector for a lithium battery containing 0.1 to 10 wt% manganese and 0.1 to 2 wt% copper, magnesium, and zinc.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tony Chuo whose telephone number is (571) 272-0717. The examiner can normally be reached on M-F, 8:30AM to 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Barr can be reached on (571) 272-1414. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

TC 3/21/06


MICHAEL BARR
SUPERVISORY PATENT EXAMINER